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EXAMINER	
CHIEN, LUCY P	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/799,396	RHEE ET AL.	
	Examiner	Art Unit	
	Lucy P. Chien	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-28 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-28 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 12 March 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

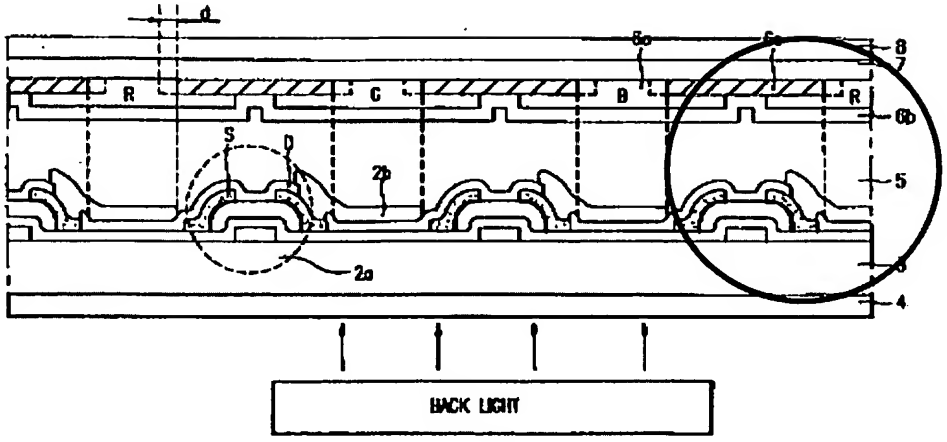
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1,24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) in view of Lyu (US 5754261).

Kadota et al teaches in Figure 1 a plurality of thin film transistors (TFT, 3) formed on the substrate (20). A plurality of three primary color filters (8,9,10) formed on the substrate (20). A plurality of first pixel electrodes (1) formed on the color filters (8,9,10) and connected to the thin film transistors (TFT, 3) to complete a liquid crystal display with color filters.

Kadota does not disclose the second pixel electrode on the substrate.

Lyu in Figure 2 discloses the (circled in drawing below) second pixel electrode (2b) formed on the substrate (3) connected to the thin film transistor (2a) and the second pixel electrode do not overlap the other color filters (R,G,B). The second pixel is located on the same layer as all the other color filters.The second pixel electrode is included to add another color filter or white filter.



It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to add another second pixel electrode that doesn't overlap another color filter to be able to add on another filter to brighten the display or add more color effects to the display.

Regarding Claim 24,

In addition to Kadot et al and Lyu, Lyu discloses the second pixel electrodes (circled) do not overlap any filters (R,G,B).

Claim 2,3,6,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) in view of Takizawa et al (US 6785068)

Regarding *Claim 2*,

Kadota et al discloses in Figure 1 an organic insulating layer (11) (Column 4, Rows 52-60) used to contact the pixel electrode including a plurality of first portions disposed between the color filters (8,9,10) and the first pixel electrodes (1).

Kadota et al and Lyu do not disclose that the second portion has a larger thickness than the first portion.

Takizawa et al discloses (Column 3, row 58-63) the color (red, green, blue) portion (first portion) is thicker than the light (white) color portion (second portion) to maintain a smooth surface (Column 5, Rows 35-40).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Takizawa's color thickness to provide a uniform surface. (Column 5, Rows 35-40).

Regarding *Claim 3,25,* Kadota et al and Lyu as described above in addition to Kadota et al teaches in Figure 1 an inorganic insulating layer (5) disposed between the color filters (8.9,10) and the thin film transistors (TFT, 3)

Regarding *Claim 6*,

Kadota et al and Lyu as described above ,in addition Kadota et al teaches in Figure 1 an inorganic insulating layer (5) disposed between the color filters (8.9,10) and the thin film transistor (TFT, 3).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) in view of Morozumi (Re 33882).

Kadota et al and Lyu do not disclose the use of a transparent filter.

Morozumi discloses (column 10, row 48-60) the use of a white filter (transparent filter) under a electrode (Figure 9a, (96)) used to brighten the display.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Morozumi's white filter to improve the overall brightness of the display (Column 10, Rows 54-60).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) and of Morozumi (Re 33882) in view of Kawase (US 6787275).

Regarding *Claim 5*,

Kadota et al, Lyu, and Morozumi do not disclose the transparent filter being made of a transparent photosensitive material or acrylic material.

Kawase discloses (Column 23,Row 18-25) the transparent filter made of a transparent photosensitive material for excellent light transmittance.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Morozumi's white filter to include Kawase's transparent photosensitive material to display excellent transmittance of visible light. (Column 23,Row 18-25).

Claim 7-10,26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) in view of Sunohara et al (US 5587819).

Regarding Claim 7,8,26,

Kadota et al and Lyu do not disclose the first pixel electrode including third, fourth, and fifth pixel electrodes located under the red, green, and blue color filters.

Sunohara et al discloses in Fig. 28 the three major colors being red, blue, and green. The first pixel electrodes include third, fourth and fifth pixel electrodes and the red, green and blue color filters are located under the third fourth, and fifth pixel electrodes, respectively.

It would have been obvious to one of skilled in the art to modify Kadota et al and Lyu to include Sunohara's color filter arrangements motivated by the desire to provide high luminance colors (Column 34, Rows 41-55).

Regarding *claim 9*,

Kadota et al and Lyu do not disclose the first and second pixel electrodes arranged in a 2x3 matrix where all the pixels are arranged in sequence.

Sunohara et al also discloses in Figure 28 a 2x3 matrix having a first row including third (first pixel) fifth (second pixel) and fourth pixel (third pixel) electrodes arranged in sequence and a second row including fourth (fourth pixel), second (fifth pixel) and third pixel (sixth pixel) electrode arranged in sequence to provide high luminance colors (Column 34, Rows 41-55).

Regarding *Claim 10*,

Kadota et al and Lyu do not disclose a 2x2 matrix having the pixel electrodes arranged in sequence as claimed.

Sunohara discloses in Figure 3, a 2x2 matrix having the first row including third (first pixel) and fourth pixel electrodes (third pixel) arranged in sequence and a second

row including fifth (fifth pixel) and second pixel electrodes (second pixel) arranged in sequence to provide high luminance colors.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Sunohara et al's primary colors in the arranged order to provide high luminance colors (Column 34, Rows 41-55).

Claim 11,20,28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) in view of Park et al (US20020074549).

Regarding *Claim 11,*

Kadota et al discloses in Figure 1 a first substrate (20) A plurality of gate lines (3) formed on the first substrate (20). A gate insulating layer (4) formed on the gate lines (3); a semiconductor layer (2) formed on the gate insulating layer (4); a plurality of data lines (not shown, known existence) formed on the gate insulating layer (4) and intersecting the gate lines (3) to define a plurality of pixel areas; a first protective layer (5) formed on the data lines (not shown, known existence); a plurality of red (8), green (9), blue (10) color filters formed on the first protective layer (5). A second protective layer (11) formed on the color filters (8,9,10). A plurality of pixel electrodes (1) formed on the second protective layer (11) the electrodes being connected (CON) to the data lines through the semiconductor layer (2). A second substrate (12) facing the first substrate (20). A common electrode (13) formed on the second substrate (12) and a

liquid crystal layer (shown between 13 and 1) interposed between the first substrate (20) and second substrate (20).

Kadota et al does not disclose an Ohmic contact layer nor does Kadota et al disclose the liquid crystal layer interposed between the first substrate and second substrate wherein the pixel areas include a plurality of white pixel areas having no color filter.

Park et al (Page 5 Row [0097]) teaches the use of an Ohmic contact layer used to reduce contact resistance to provide better contact between semiconductors.

Morozumi discloses (column 10, row 48-60) that the use of white (transparent) filters (pixels) are used so that the overall brightness of the display can be improved.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and also to include Park et al's ohmic contact layer to provide excellent contact between semiconductors and to display excellent transmittance of visible light with white filters.

Regarding *Claim 20*, Kadota et al, Morozumi and Park et al as described above in addition Kadota et al teaches (Column 4, Row 30-37) a black mask used as a light shielding layer.

Regarding Claim 28, in addition to Kadota et al, Morozumi and Park et al as described above, Kadota discloses a black matrix disposed on the first substrate and defining the pixel area (Column 6, Claim 3).

Claim 12,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Yamada (US 6798471).

Kadota et al, Morozumi and Park et al do not disclose the use of a vertical aligned liquid crystal.

Yamada discloses (Column 1, Rows 19-26) that the use of a vertically aligned liquid crystal provides higher contrast, higher response speed, and excellent viewing angle characteristics.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and Park et al's ohmic contact layer to include Yamada's vertically aligned liquid crystal to provide excellent viewing angles for the display.

Claim 13,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) and of Yamada (US 6798471) in view of Kim et al (US 20020145695).

Kadota et al, Morozumi, Park et al and Yamada do not disclose the use of protrusions formed on the common electrode and made of organic material, wherein the pixel electrodes have cutouts.

Kim et al discloses in FIG. 1E (page 3, [0044]) the common electrode 400, and the protrusion 412 is formed on the common electrode 400. The protrusion 412 is made of organic material used to form contacts between semiconductors. Fig. 3a

shows arrangements of the same invention of the pixel electrode (90) cutouts corresponding to the common electrode (400). Which stabilize the electric field (Page 4, [0062]).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and Park et al's Ohmic contact layer and Yamada's vertically aligned liquid crystal to include Kim et al's protrusions for better stabilization of the electric field (Page 4, [0062]).

Claim 14,19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Kawase (US 6787275).

Regarding *Claims 14 and 19*,

Kadota et al, Morozumi, and Park et al do not disclose the liquid crystal layer having a twisted alignment.

Kawase discloses in Figure 40 (Column 26, Rows 54-60) having a twisted nematic liquid crystal serves as a transmission of light liquid crystal.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter to include Kawase's twisted nematic liquid crystal to control the transmission of light. (Column 26, Rows 54-60)

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Takizawa et al (US 6785068).

Kadota et al, Morozumi and Park et al do not disclose the white pixel area thicker than the first portion.

Takizawa et al discloses (Column 3, row 58-63) the color (red, green, blue) portion (first portion) is thicker than the light (white) color portion (second portion) to maintain a smooth surface (Column 5, Rows 35-40).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and also to include Park et al's ohmic contact layer to include Takizawa's color thickness to provide a uniform surface. (Column 5, Rows 35-40).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) and of Morozumi (Re 33882) in view of Park et al (US20020074549)

Kadota et al and Lyu do not disclose a transparent filter and an Ohmic contact layer.

Park et al (Page 5 Row [0097]) teaches the use of an Ohmic contact layer used to reduce contact resistance to provide better contact between semiconductors.

Morozumi discloses (column 10, row 48-60) that the use of white (transparent) filters (pixels) are used so that the overall brightness of the display can be improved.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device and Lyu's color display device with second pixel electrodes on the same layer as the other color filters to include Morozumi's white filter and also to include Park et al's ohmic contact layer to provide excellent contact between semiconductors and to display excellent transmittance of visible light with white filters.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 6462798) and of Morozumi (Re 33882).

Regarding Claim 21,

Kim et al (Figure 3a) disclose a first substrate (31), a plurality (there are other pixels located next to the pixel shown in Figure 3a) of thin film transistors (column 3, Rows 39-44) formed on the first substrate (31), a plurality of pixel electrodes (13) connected to the thin film transistors, each pixel electrode having a first domain divider (51), a second substrate (33) facing the first substrate (31), a common electrode (17) formed on the second substrate (33), a liquid crystal layer (in between the two substrates) interposed between the first substrate (31) and the second substrate (33), wherein the pixel electrodes comprise red pixel electrodes that display red color, green pixel electrodes that display a green color, and blue pixel electrodes that display a blue color (Column 4, rows 40-50).

Kim et al does not disclose wherein the pixel electrodes comprise white pixel electrodes that display a white color.

Morozumi discloses (column 10, row 48-60) that the use of white (transparent) filters (pixels) are used so that the overall brightness of the display can be improved.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kim et al's color display device to include Morozumi's white filter and to provide excellent contact between semiconductors and to display excellent transmittance of visible light with white filters (column 10, row 48-60).

Regarding claim 22,

In addition to Kim et al and Morozumi as disclosed above, Kim et al discloses a second domain divider (53) formed on the common electrode (17).

Regarding claim 23,

In addition to Kim et al and Morozumi as disclosed above, Kim et al discloses the first domain divider (51) is a cutout of the pixel electrode (13) and the second domain divider (53) is a protrusion formed on the common electrode, (17) and wherein the second domain divider is made of BenzoCycloButene-based polymer which is a organic material (Column 4, Rows 48-55)

Claim 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Takizawa et al (US 6785068)

Kadota et al discloses in Figure 1 an organic insulating layer (11) (Column 4, Rows 52-60) used to contact the pixel electrode including a plurality of first portions disposed between the color filters (8,9,10) and the first pixel electrodes (1).

Kadota et al, Lyu, Morozumi, Park et al do not disclose that the second portion has a larger thickness than the first portion.

Takizawa et al discloses (Column 3, row 58-63) the color (red, green, blue) portion (first portion) is thicker than the light (white) color portion (second portion) to maintain a smooth surface (Column 5, Rows 35-40).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Takizawa's color thickness to provide a uniform surface. (Column 5, Rows 35-40).

Response to Arguments

Applicant's arguments filed 9/29/2005 have been fully considered but they are not persuasive.

Regarding the rejection of Claim 1, applicant argues that Lyu fails to disclose the limitation that the pixel electrodes "do not overlap the color filters". Arguments state that Lyu discloses "the black matrix pattern is positioned to allow light to pass through the pixel electrodes and through the red, green, and blue color filters" thus, indicates that the color filters do indeed overlap the pixels.

The examiner disagrees with this conclusion and maintains the rejection. Applicant discloses in Claim 1 "a plurality of three primary color filters formed on the substrate" Lyu discloses that the second pixel electrode (the circled part of the figure shown below) does have a color filter but examiner is using that circled part to show that all the pixel electrodes (R,G,B) do not overlap each other. Hence, the second pixel electrodes (circled below) does not overlap the three primary color filters (R,G,B) also known as the first pixel electrodes.

Regarding the rejection of Claim 2, applicant argues that the first and second portions are not organic insulating layers. Examiner points out that Takizawa discloses (Column 10, 25-35) the color material is disposed within the transmissive resin, which is a organic insulating layer. Also, applicant argues that the examiner has not stated that the first (deep color) portions in Takizawa are disposed between the color filters and the first pixel electrodes similarly that the second portion are "disposed under the second pixel electrodes." Also that the light portion in Takizawa are disposed under any second pixel electrodes. It would have been obvious that the first portions would be disposed between the color filters shown in Kadota (R,G,B) and Lyu (the non circled parts) and that the light portion would be disposed under any second pixel electrodes shown in Lyu (circled). Examiner used Takizawa to show that the first portions (color portion) is thicker than the light color (white) portions to maintain a smooth surface.

Regarding the rejection of Claim 11, applicant argues that Kadots does not disclose forming gate lines on a substrate, followed by a gate insulating film, followed by a semiconductor layer. Claim 11 does not read as a method claim. Thus, finding the

structure itself hits Claim 11. Also, it is inherent that the gate lines are present to control the TFT have and layers of semiconductor layers to form a conductive channel between the source and drain electrodes. Applicant argues that Kadota does not have a semiconductor layer formed on the gate insulating layer. Examiner points out that it is known to do so. Park et al discloses the semiconductor over the gate insulating film (Abstract).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy P. Chien whose telephone number is 571-272-8579. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lucy Chien
Examiner
Art Unit 2871
LC

ANDREW SCHECHTER
PRIMARY EXAMINER